

# PATENT SPECIFICATION



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186,060

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Complete Accepted: Feb. 22, 1923.

## COMPLETE SPECIFICATION.

### Improvements in or relating to Pistons.

I, CHRISTIAN BERGH BACKER, a Norwegian subject, of 7, Haakonsgate, Bergen, Norway, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

It is a known disadvantage in aluminium pistons for internal combustion engines, that the aluminium and aluminium alloy used have a comparatively large expansion due to heat, so that the piston has to be given a considerable clearance in its cylinder, thus causing an unsatisfactory operation when the piston is not sufficiently heated. Other light metal alloy pistons such as magnesium and magnesium alloy pistons have the same disadvantage.

It has now been found that in pistons of magnesium or magnesium alloys the said disadvantage may be avoided, owing to the great elasticity of magnesium, by providing the piston near its upper end with a steel or iron band which is threaded or shrunk on the piston. Owing to the great elasticity of magnesium the heat expansion of the magnesium or magnesium alloy piston is then determined by the heat expansion of the steel band. As the temperature of such a piston will always be lower than the temperature of a cast iron piston, owing to the large heat conductive capacity of magnesium the clearance between piston and cylinder wall for a magnesium or magnesium alloy piston constructed according to the present invention may even be made smaller than the clearance for a cast iron piston.

It is known to provide aluminium alloy pistons with similar steel bands for the purpose of taking up the wear on the piston surfaces. This known use of steel bands on aluminium alloy pistons does not however serve the same purpose as the steel bands for taking up heat expansion according to the present invention, nor is it possible to take up the heat expansion of an aluminium piston by means of a

steel band of this kind, as the modulus of elasticity of aluminium is nearly three times as high as that of magnesium. Also, in order to prevent piston slap it has been proposed to provide pistons of aluminium or other metal having a higher coefficient of expansion than that of the cylinder with one or more continuous wearing-rings of iron or steel, which rings may be secured in position during casting or may be pressed or screwed on to the piston body.

The present invention relates only to the combination of a band of steel, iron or other similar metal having a sufficiently high modulus of elasticity with a magnesium or magnesium alloy piston for the purpose of limiting the radial expansion of the piston due to heat.

On the accompanying drawing is illustrated an axial section through a piston in accordance with the invention.

The magnesium or magnesium alloy piston 1 is provided near its top with a steel or iron band 2 threaded on the piston and secured by a small rivet 3. The band 2 may be provided in the usual manner with grooves 4 for piston rings.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. The combination with a magnesium or magnesium alloy piston of a band of steel, iron or other similar metal having a sufficiently high modulus of elasticity which band is threaded or shrunk on the piston for the purpose of limiting the radial expansion of the piston due to heat.

2. The piston substantially as described and illustrated in the accompanying drawing.

Dated this 12th day of September, 1922.

CHRISTIAN BERGH BACKER,  
Per Boulton, Wade & Tennant,  
111 & 112, Hatton Garden, London,  
E.C. 1,

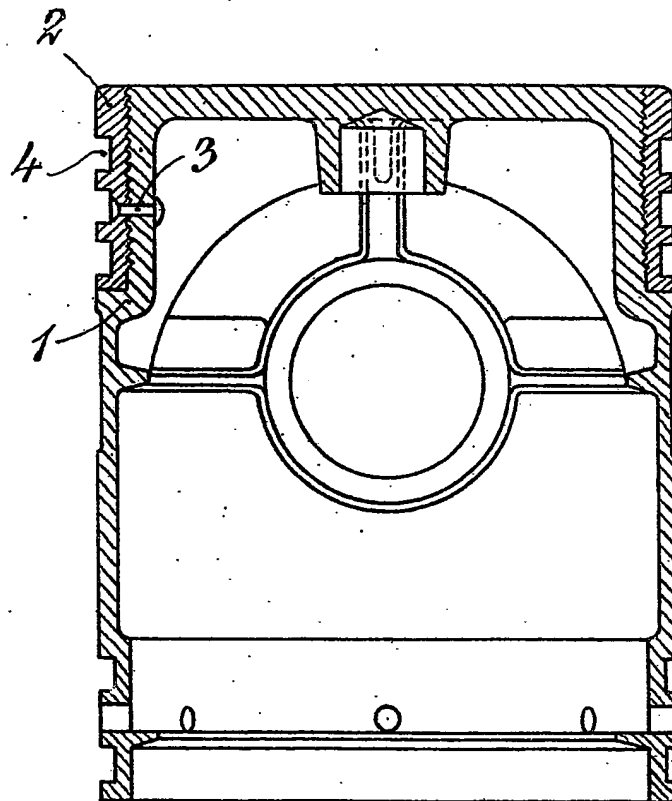
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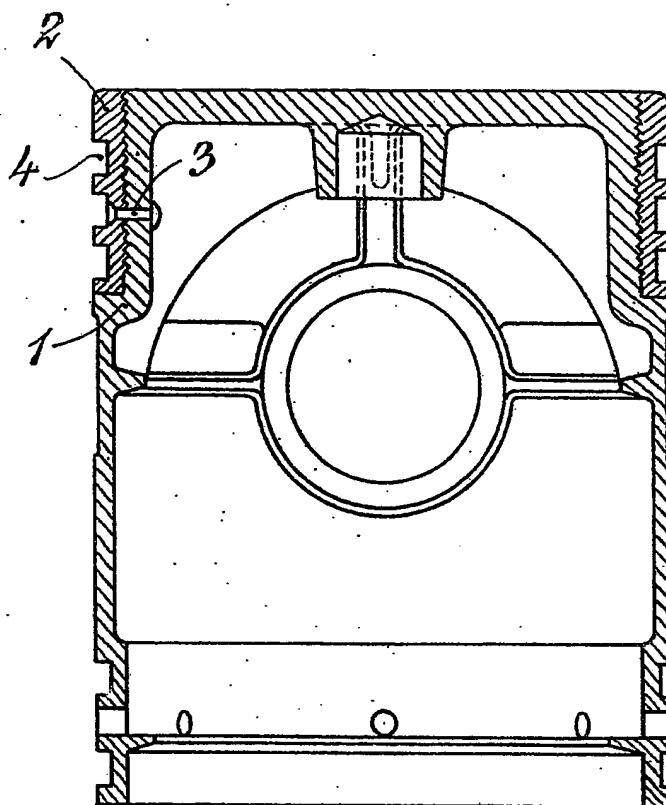
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